ing along at the bottom of a stream with a velocity of

3 inches per second will work upon and carry away particles of				fine clay.
6	do.	do.	do.	fine sand.
8	do.	do.	do.	coarse sand.
12	do.	do.	do.	fine gravel.
24	do.	do.	do.	coarse gravel.
36	do.	do.	do.	gravel 1 in. diam.
60	do.	do.	do.	,, 2 in. ,,
72	do.	do.	do.	stones 5 in. ,,
84	do.	do.	do.	,, 7½ in. ,,

It would appear, therefore, from these experiments that in order to maintain the *present* breadth, depth, and velocity of the river between Westminster and Waterloo bridges, very coarse gravel is required for the bed; between Waterloo and Blackfriars bridges, gravel 1 inch diameter is required for the bed; between Blackfriars and Southwark bridges, gravel 1½ inch diameter is required for the bed; and between Southwark and London bridges, gravel-stones 2 inches diameter are required for the bed. This shows at once that the indurated mass of gravel and clay, of which the present bed of the river is composed, does not offer a resistance, in the greatest run of the tide, sufficient to counteract the momentum of the flowing and reflowing of the tides; and, in consequence, the reason of the deepening of the channel (assisted, indeed, by dredging), is strikingly manifested since the removal of the great dam or obstruction to the flowing and ebbing of the tides, namely old London-bridge.

London and its environs now contain a population of upwards of two millions of souls, and nearly all the impurities that are engendered within this great city and its suburbs are permitted to be discharged into the sewers by drains; almost every dwelling or other premises may now be drained, as sewers, which are of comparatively modern construction, are arranged and placed at such depths below the surface of the lower floors of buildings as are *considered* sufficient to afford perfect drainage from the various tenements. It must be obvious that the impurities, when discharged into the sewers, should not be allowed to deposit and accumulate within them, but should be carried off to the river as fast as engendered, and with the greatest possible speed. The same principle is also applicable to the discharge of the impurities, when received into the river. Nearly all the sulliage matter, as it is discharged by the Westminster, the City of London, the Tower Hamlets, and the Surrey sewers, into the river, becomes deposited upon its banks. Between Putney and London bridges the river is of a serpentine form, and its banks are of very unequal width. At low-water, vast quantities of mud and *living* corruption are exposed to view, at those situations upon its banks which are flat and wide. These accumulations are by far more frequent on the north shore of the river, and are the deposited matters brought down and discharged into the river by the various sewers. Numerous accumulations of it may be seen between Battersea and Blackfriars bridges, and the shore at low water in several places is of a reddish colour. When examined, the cause of this colour is found to arise from myriads upon myriads of small red living worms, embedded in the mud, and entwined together for several inches in depth. At one place between the Horseferry and the new Houses of Parliament, there is an extensive bank of mud, varing in depth up to 5 feet, and the surface of this bank is nothing else than a congeries of worms entwined together, and exceeding a foot in depth. When disturbed, the heaving of the mud is very perceptible, and the stench from them is noisome in the extreme.

In front of Whitehall-gardens, the accumulation of matter from the sewers is nearly 6 feet deep. Nearly the whole of the surface at this point is of a reddish colour, and is also covered with myriads of worms; and at low-water, carrion-crows may very frequently be seen feeding upon them. In warm weather streams of exhalations are evolved from these extended heaps of abomination; and the effluvia being mixed with the atmosphere, are wafted into the streets and dwellings, and, of course, are inhaled by passengers and by the neighbouring inhabitants. The residences of the Duke of Buccleuch, Marquis of Ailsa, Earl of Harrington, and Sir R. Peel, are situate in this locality; and these noblemen and gentlemen are thus living surrounded by a bog, and inhaling air of the most nauseous description.

GOTHIC TRACERY PRODUCED BY MACHINERY.

We mentioned last week that Mr. Billings had brought under the notice of the Institute of Architects, Pratt's patent carving machine. From the time of the revival of pointed architecture in England to the present day, architects, even when they had skill (too seldom alas!), have been trammelled in their efforts to produce works approaching in excellence to those of the middle ages, by the great cost at which alone it was to be effected. At this moment the principles of pointed architecture are better understood than they ever were, and but for the circumstance just mentioned we might hope to see structures raised equal in beauty to the wonderful productions of our forefathers. In designing an edifice in this style, however, the inquiry, now ever present to architects is, what can be done without—how much decoration can be omitted, and yet the characteristics of the style be retained? and so they are compelled to pare, and shear, and leave out, and necessarily fall very short of the early works, which were usually the result of a long period of time, and were effected without regard to the total cost. A variety of expedients in the shape of imitations have been resorted to, but are now very properly abandoned.

By the machine recently patented, and which we have examined with great satisfaction, the difficulty here alluded to will be considerably lessened, insomuch as by its means, the most elaborate tracery can be carved *out of the solid wood or stone* with great rapidity, and for about one-third of the sum it would cost if executed by hand. It is capable of working any form, however elaborate, even to the tracing of a map, and is yet so simple in its operations, that a few hours' practice will enable any mechanic to work it. It may be described as presenting a union of the lathe, drill, and pentegraph. A small cutting tool is made to revolve very rapidly by means of steam power, while, at the same time, it is enabled to pass over the lines of a pattern (formed of cast-iron) which is fastened down on to the wood or stone that is to be carved. A further motion is given by means of the table on which the material is placed; and it is in the production of these various motions that the invention chiefly consists. The tool is said to make 3,000 revolutions in a minute, and, as it presents eight cutting edges on its circumference, 24,000 cuts. The hardest oak, the softest pine, and the most brittle stone are equally operated upon; and the largest spandrel of a roof, or the smallest screen-work can be produced. The patterns being inexpensive, it is stated that every panel of a screen may be different without much increasing the cost. The machine was invented by a Mr. William Irving, and was used in the first instance simply for inlaying floors, &c. The credit of its application to carving and other architectural purposes belongs, we believe, to Mr. Pratt, who, discerning its capabilities, effected an arrangement with the inventor, and patented the machine. He has executed, amongst other works, a roof for Ravensworth Castle, and a screen for Great Malvern Church.

We cannot avoid regarding this invention as a most important occurrence for the interests of architecture, and anticipate from it the best results. It has not even the disadvantage which in the first instance usually attends machinery, that of superseding manual labour: on the contrary, it will probably increase the occasion for it, by introducing a description of work not hitherto within the architect's means; and, as the artist's hand is required for the bosses, crocketts, and other enrichments (which the machine merely blocks out), may call into operation a school of carvers.

Protection of Works of Art.—A bill for this purpose has been brought into the House of Commons by the Solicitor-General.

Royal Academy of Arts.—A notice has been issued to the effect, that all works of painting, sculpture, or architecture, intended for the ensuing exhibition in Trafalgar-square, must be sent in on Monday, the 7th, or by six o'clock in the evening of Tuesday, the 8th of April next, after which time no work can possibly be received, nor can any works be received which have already been publicly exhibited.

BRICKS AND BRICKMAKING.

In one of the previous numbers of The Builder, the writer observed an extract from the *Mining Journal*, relative to the manufacture of bricks, in which it was stated that an admixture of chalk with the clay from which they are made is injurious to the quality and strength of the bricks; this to a certain extent is true, but not so much so as the author of that paragraph would lead us to infer. Some soils are in the manufacture of bricks are so loose and incohesive, that unless they are held together, as the workmen term it, by an intermixture of chalk, it would be scarcely possible to make them into bricks of any value, either for the market or for building. It must, however, be admitted, that if there is an over proportion of chalk thrown into the clay, more particularly if the chalk is not well mixed, the bricks so made must of necessity be bad both in appearance and quality.

And as it mostly happens that chalk is accessible to brickmakers, they do not fail to employ a very considerable quantity of it in their process of manufacture, which, if badly prepared and improperly used, unquestionably deteriorates the useful value of the bricks; so long, however, as they can contrive to keep them of good colour, they are satisfied even if they possess no other recommendable quality; because they can always dispose of their stock to cutting builders, who care little for the quality of the material they use in any kind of building, the speculative, of course not excepted. Good clay is a great thing in brickmaking; but *time* and *labour* are as great, if indeed not greater, for indifferent clay with plenty of time and labour will make quite as good bricks as the best clay improperly used if the labour in either case is stinted, the quality of the bricks will be injured one way or another.

If pure argillaceous earth is to be used it should always be mixed with chalk and some care being of course taken not to put in too much of either; the sand should be as clean and free from impurities as possible, and the more silex it contains the better, as it will help to harden the bricks when they are burnt; however, there should be too much silicious matter, they will either fuse and run together into clinkers, or else they will turn out so brittle and shaky to be of much service to the builder. If too much chalk is put in, the bricks will be rotten and porous, for it appears to have the effect of preventing the intimate union of the sand and clay when being burnt, but if properly applied, it improves the bricks both in quality and colour. To make good bricks it is essential that the earth should be exposed freely for some time to the action of the atmosphere, after it has been first dug out of its native bed, and if it be subjected to the action of frost for some weeks before it is ground up, so much the better for the quality of the manufactured article; the more the earth is pulverized and beaten, the better will it be tempered, so that labour, as I before observed, is one of the very best materials in the whole range of brick-making, as it is with almost everything else; but time and labour being of a high price, the brick-makers of course avoid the use of them both as much as possible. Good silicious sand when mixed with the clay fuses when at a red heat, and incorporates itself intimately with the other particles of matter in the bricks, and, like most other good ingredients, it solidifies on cooling into a hard close-grained, compact body, capable of resisting the alternate changes of the atmosphere longer perhaps than any other material of a similar production: it is the silex that gives the brick the sharp sonorous ring when struck together, and if there is not too much of it, and it is not too highly scorched in the clamp or kiln, the brick will be more durable than most of the stones used for building purposes. If chalk is mixed with clay merely in a broken state, without being washed and ground, the bricks are sure to turn out more or less faulty; the best way of using chalk is to grind it in the large mill, and reduce it to a kind of hydrate, and then pour it over the clay, previously prepared to receive it; as soon as it has settled, the superfluous water should be run off, and after a little time, allowed for the remainder of the water partially to evaporate, it should be intimately mixed with the clay by digging, pounding, and raking, and the more thoroughly it is incorporated with the clay the better.